



US005825421A

**United States Patent** [19]  
**Tan**

[11] **Patent Number:** **5,825,421**  
 [45] **Date of Patent:** **Oct. 20, 1998**

[54] **VIDEO CODING METHOD AND DECODING METHOD AND DEVICES THEREOF**

[75] **Inventor:** Thlow Keng Tan, Singapore, Singapore

[73] **Assignee:** Matsushita ELECTRIC Industrial Co., Ltd., Osaka, Japan

[21] **Appl. No.:** 773,574

[22] **Filed:** Dec. 27, 1996

[30] **Foreign Application Priority Data**

Dec. 27, 1995 [JP] Japan ..... 7-340609

[51] **Int. Cl.<sup>6</sup>** ..... H04N 7/32

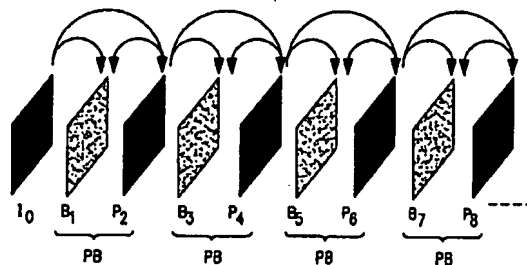
[52] **U.S. Cl.** ..... 348/409; 348/413; 348/415; 348/699

[58] **Field of Search** ..... 348/409, 413, 348/415, 396, 416, 699, 402; 382/56; H04N 7/32

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

5,136,378	8/1992	Tsurube .....	358/136
5,144,426	9/1992	Tanka et al. ....	358/133
5,150,432	9/1992	Ueno et al. ....	382/56
5,155,593	10/1992	Yonemitsu et al. ....	358/133
5,267,334	11/1993	Nornulle et al. ....	382/56
5,293,229	3/1994	Iu .	
5,315,326	5/1994	Sugiama .....	348/415
5,361,105	11/1994	Iu .	
5,386,234	1/1995	Veltman et al. ....	348/409
5,412,428	5/1995	Tahara .....	348/396
5,481,310	1/1996	Hibi .....	348/413



PB FRAME PREDICTION

**OTHER PUBLICATIONS**

Secretariat: Japan (JISC), "Coded Representation of Audio, Picture, Multimedia and Hypermedia Information," ISO/IEC JTC 1/SC 29 N 313, dated May 20, 1993.

"Recommendation H.261—Video Codec for Audiovisual Services at px 64 kbit/s", International Telegraph and Telephone Consultative Committee, Study Group XV—Report R 37, Aug. 1990.

*Primary Examiner*—Tommy P. Chin

*Assistant Examiner*—Tung Vo

*Attorney, Agent, or Firm*—Ratner & Prestia

[57] **ABSTRACT**

A new predictive coding is used to increase the temporal frame rate and coding efficiency without introducing excessive delay. Currently the motion vector for the blocks in the bi-directionally predicted frame is derived from the motion vector of the corresponding block in the forward predicted frame using a linear motion model. This however is not effective when the motion in the image sequence is not linear. The efficiency of this method can be further improved if a non-linear motion model is used. In this model a delta motion vector is added to or subtracted from the derived forward and backward motion vector, respectively. The encoder performs an additional search to determine if there is a need for the delta motion vector. The presence of this delta motion vector in the transmitted bitstream is signalled to the decoder which then takes the appropriate action to make use of the delta motion vector to derive the effective forward and backward motion vectors for the bi-directionally predicted block.

**12 Claims, 6 Drawing Sheets**

